



Clean Water — Water Treatment at Mining Sites

Colorado's mining history is both a precious legacy and an environmental challenge. Water flowing through abandoned mine workings, waste rock or mill tailings becomes contaminated with heavy metals and can be difficult to manage effectively. When this contaminated water (called acid mine drainage or acid rock drainage, depending on the source) enters streams and rivers, it harms fish and other aquatic life. It also creates additional expense for water utilities, which must remove excess metals from drinking water.

Why is this important?

Source control methods, such as capping waste rock and tailings piles and installing plugs in mine tunnels, helps keep the metals out of Colorado's waterways. But mining was so extensive and metals so prevalent at some sites that active water treatment is the only option. Balancing source control and active water treatment is crucial to sustainability. Capping piles and plugging tunnels prevents acid drainage, reducing the ultimate cost of treatment, while active water treatment plants, though expensive to operate, effectively remove contamination from Colorado waterways. The ultimate indicator of healthy rivers will be attaining water quality standards and healthy aquatic communities in waterways previously damaged by historic mining activities. Restored rivers create new opportunities for fishing and rafting, as well as new jobs in the tourism and outdoor recreation sector.

Where are we?

Water treatment plants exist at historic mining sites around the state, including a newly opened plant at the Summitville Mine in Rio Grande County. Some of these plants are operated by the parties responsible for the pollution, while some are operated jointly by the Colorado Department of Public Health and Environment and the U.S. Environmental Protection Agency. Still others are operated by the state alone. Together, these plants remove tons of dissolved metals from Colorado waterways every year.

Plant	Affected Waterway	Millions/Gallons of Water Treated per Year (2011)
Argo Tunnel	Clear Creek	118
Clear Creek North Fork Plant	North Clear Creek	0 (expected on line 2013)
Eagle Mine	Eagle River	135
Summitville Mine	Alamosa River	260
Yak Tunnel	Arkansas River	425
Total		938

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Clean Air Clean Water Infectious Disease Prevention Injury Prevention
Mental Health and Substance Abuse Obesity Oral Health Safe Food Tobacco Unintended Pregnancy

Where do we want to be?

The following figures indicate projections of the amount of water to be actively treated in 2016. The ultimate goal is to develop new technologies that will more efficiently and effectively reduce the need for active treatment in the future.

Plant	Affected Waterway	Millions/Gallons of Water Treated per Year (Projected 2016)
Argo Tunnel	Clear Creek	118
Clear Creek North Fork Plant	North Clear Creek	105
Eagle Mine	Eagle River	135
Summitville Mine	Alamosa River	380
Yak Tunnel	Arkansas River	425
Total		1163

What is being done?

A newly completed water treatment plant in Summitville is online, and treatment rates will increase over the next several years, improving the health of the Alamosa River.

A pipeline to convey contaminated mine drainage water to a proposed new water treatment plant in North Clear Creek will be completed in early 2012. Construction on the proposed plant, currently in the design phase, is expected to begin in mid-2012. When operational, the plant will treat up to 600 gallons per minute, keeping dissolved metals from the National Tunnel, Gregory Gulch and the Gregory Incline from killing fish in the North Fork of Clear Creek.

In Idaho Springs, the Colorado Department of Public Health and Environment is designing improvements to the Argo Tunnel Water Treatment Plant that will achieve a 75 percent reduction in the volume of residual filter cake, meaning less solid waste will be sent to landfills as a result of water treatment.

High-risk groups

Mining-related contamination from heavy metals poses a threat to fish and other aquatic life such as insects, and generally is not a threat to human health. However, municipal water utilities must remove the metals from drinking water supplies, which imposes operational and budgetary burdens.

Underlying causes

Rain and melting snow percolate through soil, filling abandoned mine shafts and seeping through waste rock and mill tailings piles scattered around the high country. Sulfur in the disturbed rock raises the water's acid level, dissolving metals such as zinc, copper, cadmium and manganese, which can enter streams and rivers.

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